CLAIMS

1. A digital signal processor (DSP) to execute at least one dedicated operation of a dedicated system (DFE-XDSL), **characterized in that** said digital signal processor is a flexible digital signal processor and comprises therefor:

- an arithmetic logical unit (ALU) that comprises a plurality of inputs (IN) to receive input data (DATA-IN); and a predefined interconnected plurality of basic operators (OP1, OP2, OP3, OP4, OP5, OP6, OP7) coupled to said plurality of inputs (IN) for execution of a respective basic operation on said received input data (DATA-IN); and a plurality of control inputs (IN-CTRL) coupled between said predefined plurality of basic operators (OP1, OP2, OP3, OP4, OP5, OP6, OP7) and a program controller (CTRL); and

- said program controller (CTRL) to activate via said plurality of control inputs (IN-CTRL), for at least one phase of a control program of said program controller (CTRL) and under control of an actual phase of said at least one phase, one or more basic operators (OP1, OP2, OP3, OP6) of said plurality of basic operators (OP1, OP2, OP3, OP4, OP5, OP6, OP7) and to enable thereby said one or more basic operators (OP1, OP2, OP3, OP6) to execute its respective basic operation and to realize therewith at least part of a dedicated operation of said dedicated system (DFE-XDSL); and

- said arithmetic logical unit (ALU) further comprises a plurality of outputs (OUT) to receive, upon realization of each phase of said at least one phase of said control program, an output data (DATA-OUT) whereby said output data (DATA-OUT) represent a result of said execution of said at least one dedicated operation of said dedicated system (DFE-XDSL).

2. The flexible digital signal processor (DSP) according to claim 1, characterized in that said program controller comprises a start input to

control a start of an execution of said control program and a finish output to sign a finishing of said control program and further characterized in that a phase of control program comprises a set of instructions being designed in accordance to a desired said at least one dedicated operation.

3. The flexible digital signal processor (DSP) according to claim 1, characterized in that said dedicated system is a digital front-end system (DFE-XDSL) of any digital subscriber line system.

4. The flexible digital signal processor (DSP) according to claim 3, characterized in that a dedicated operation of said dedicated system is anyone of an interpolation operation, a decimation operation, a biquad filter operation, a Finite Impulse Response filter operation, a complex to real operation inversion operation and a real to complex inversion operation.

5. A digital subscriber line system that comprises a digital front-end system (DFE-XDSL), **characterized** in that said digital front-end system (DFE-XDSL) comprises one or more flexible digital signal processors (DSP) according to claim 1.

6. A method to execute at least one dedicated operation of a dedicated system (DFE-XDSL) by a digital signal processor (DSL), **characterized in that** said method comprises:

- receiving input data (DATA-IN) by a plurality of inputs (IN) coupled to a predefined plurality of interconnected basic operators (OP1, OP2, OP3, OP4, OP5, OP6, OP7) of an arithmetic logical unit (ALU) of said flexible digital signal processor (DSP); and for at least one phase of a control program of a program controller (CTRL):

- activating via a plurality of control inputs (IN-CTRL) being coupled between said predefined plurality of basic operators (OP1, OP2, OP3, OP4, OP5, OP6, OP7) and said program controller (CTRL), under control of an actual phase of said control program, one or more basic operators (OP1, OP2, OP3, OP6) of said predefined plurality of basic operators (OP1, OP2, OP3, OP4, OP5, OP6, OP7); and

- executing on said received input data (DATA-IN) one or more basic operations by said one or more activated basic operators of said dedicated system (DFE-XDSL); and

- realizing each phase of said at least one phase of said control program and generating thereby an output data (DATA-OUT) representing a result of said execution of said at least one dedicated operation of said dedicated system (DFE-XDSL).